

SEQUENCE LISTING

<110> Reactive Surfaces
McDaniel, C. Steven

<120> Recombinant Organophosphorus Acid Anhydrase and Methods of
Use

<130> RACT-00200

<140> Unknown

<141> 2002-12-28

<150> 07/928,540

<151> 1992-08-13

<150> 08/252,384

<151> 1994-06-01

<150> 07/344,258

<151> 1989-04-27

<160> 1

<170> PatentIn version 3.2

<210> 1

<211> 337

<212> PRT

<213> Pseudomonas aeruginosa

<400> 1

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Thr Ile Ser Glu Ala Gly Phe Thr Leu Thr His Glu His Ile Cys Gly
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Ser Ser Ala Gly Phe Leu Arg Ala Trp Pro Glu Phe Phe Gly Ser Arg
35 40 45

Lys Ala Leu Ala Glu Lys Ala Val Arg Gly Leu Arg Arg Ala Arg Ala
50 55 60

Ala Gly Val Arg Thr Ile Val Asp Val Ser Thr Phe Asp Ile Gly Arg
65 70 75 80

Asp Val Ser Leu Leu Ala Glu Val Ser Arg Ala Ala Asp Val His Ile
85 90 95

Val Ala Ala Thr Gly Leu Trp Phe Asp Pro Pro Leu Ser Met Arg Leu
100 105 110

Arg Ser Val Glu Glu Leu Thr Gln Phe Phe Leu Arg Glu Ile Gln Tyr
115 120 125

Gly Ile Glu Asp Thr Gly Ile Arg Ala Gly Ile Ile Lys Val Ala Thr
130 135 140

Thr Gly Lys Ala Thr Pro Phe Gln Glu Leu Val Leu Lys Ala Ala Ala
145 150 155 160

Arg Ala Ser Leu Ala Thr Gly Val Pro Val Thr Thr His Thr Ala Ala
165 170 175

Ser Gln Arg Asp Gly Glu Gln Gln Ala Ala Ile Phe Glu Ser Glu Gly
180 185 190

Leu Ser Pro Ser Arg Val Cys Ile Gly His Ser Asp Asp Thr Asp Asp
195 200 205

Leu Ser Tyr Leu Thr Ala Leu Ala Ala Arg Gly Tyr Leu Ile Gly Leu
210 215 220

Asp His Ile Pro His Ser Ala Ile Gly Leu Glu Asp Asn Ala Ser Ala
225 230 235 240

Ser Ala Leu Leu Gly Ile Arg Ser Trp Gln Thr Arg Ala Leu Leu Ile
245 250 255

E3
Conclude

Lys Ala Leu Ile Asp Gln Gly Tyr Met Lys Gln Ile Leu Val Ser Asn
260 265 270

Asp Trp Leu Phe Gly Phe Ser Ser Tyr Val Thr Asn Ile Met Asp Val
275 280 285

Met Asp Arg Val Asn Pro Asp Gly Met Ala Phe Ile Pro Leu Arg Val
290 295 300

Ile Pro Phe Leu Arg Glu Lys Gly Val Pro Gln Glu Thr Leu Ala Gly
305 310 315 320

Ile Thr Val Thr Asn Pro Ala Arg Phe Leu Ser Pro Thr Leu Arg Ala
325 330 335

Ser

SEQUENCE LISTING

<110> Reactive Surfaces, Ltd.

<120> Recombinant Organophosphorus Acid Anhydrase and Methods of Use

<130> RACT-00200

<140> Unknown

<141> 2003-01-02

<150> 07/928,540

<151> 1992-08-13

<150> 08/252,384

<151> 1994-06-01

<150> 07/344,258

<151> 1989-04-27

<160> 2

<170> PatentIn version 3.1

<210> 1

<211> 1014

<212> DNA

<213> Pseudomonas diminuta

<220>

<221> CDS

<222> (1)..(1011)

<223>

<400> 1

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aca atc tct gaa gcg ggt ttc aca ctg act cac gag cac atc tgc ggc
96
Thr Ile Ser Glu Ala Gly Phe Thr Leu Thr His Glu His Ile Cys Gly

20

25

30

agc tcg gca gga ttc ttg cgt gct tgg cca gag ttc ttc ggt agc cgc
144

Ser Ser Ala Gly Phe Leu Arg Ala Trp Pro Glu Phe Phe Gly Ser Arg

35

40

45

aaa gct cta gcg gaa aag gct gtg aga gga ttg cgc cgc gcc aga gcg
192

Lys Ala Leu Ala Glu Lys Ala Val Arg Gly Leu Arg Arg Ala Arg Ala

50

55

60

gct ggc gtg cga acg att gtc gat gtg tcg act ttc gat atc ggt cgc
240

Ala Gly Val Arg Thr Ile Val Asp Val Ser Thr Phe Asp Ile Gly Arg

65

70

75

80

gac gtc agt tta ttg gcc gag gtt tcg cgg gct gcc gac gtt cat atc
288

Asp Val Ser Leu Leu Ala Glu Val Ser Arg Ala Ala Asp Val His Ile

85

90

95

gtg gcg gcg acc ggc ttg tgg ttc gac ccg cca ctt tcg atg cga ttg
336

Val Ala Ala Thr Gly Leu Trp Phe Asp Pro Pro Leu Ser Met Arg Leu

100

105

110

agg agt gta gag gaa ctc aca cag ttc ttc ctg cgt gag att caa tat
384

Arg Ser Val Glu Glu Leu Thr Gln Phe Phe Leu Arg Glu Ile Gln Tyr

115

120

125

ggc atc gaa gac acc gga att agg gcg ggc att atc aag gtc gcg acc
432

Gly Ile Glu Asp Thr Gly Ile Arg Ala Gly Ile Ile Lys Val Ala Thr

130

135

140

aca ggc aag gcg acc ccc ttt cag gag tta gtg tta aag gcg gcc gcc
480

Thr Gly Lys Ala Thr Pro Phe Gln Glu Leu Val Leu Lys Ala Ala Ala

145

150

155

160

cgg gcc agc ttg gcc acc ggt gtt ccg gta acc act cac acg gca gca
528

Arg Ala Ser Leu Ala Thr Gly Val Pro Val Thr Thr His Thr Ala Ala

165

170

175

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576

Ser Gln Arg Asp Gly Glu Gln Gln Ala Ala Ile Phe Glu Ser Glu Gly

180

185

190

ttg agc ccc tca cgg gtt tgt att ggt cac agc gat gat act gac gat
624

Leu Ser Pro Ser Arg Val Cys Ile Gly His Ser Asp Asp Thr Asp Asp

195

200

205

ttg agc tat ctc acc gcc ctc gct gcg cgc gga tac ctc atc ggt cta
672

Leu Ser Tyr Leu Thr Ala Leu Ala Ala Arg Gly Tyr Leu Ile Gly Leu

210

215

220

gac cac atc ccg cac agt gcg att ggt cta gaa gat aat gcg agt gca
720

Asp His Ile Pro His Ser Ala Ile Gly Leu Glu Asp Asn Ala Ser Ala

225

230

235

240

tca gcc ctc ctg ggc atc cgt tcg tgg caa aca cgg gct ctc ttg atc
768

Ser Ala Leu Leu Gly Ile Arg Ser Trp Gln Thr Arg Ala Leu Leu Ile
245 250 255

aag gcg ctg atc gac caa ggc tac atg aaa caa atc ctg gtt tcg aat
816
Lys Ala Leu Ile Asp Gln Gly Tyr Met Lys Gln Ile Leu Val Ser Asn
260 265 270

gac tgg ctg ttc ggg ttt tcg agc tat gtc acc aac atc atg gac gtg
864
Asp Trp Leu Phe Gly Phe Ser Ser Tyr Val Thr Asn Ile Met Asp Val
275 280 285

atg gat cgc gtg aac ccc gac ggg atg gcc ttc att cca ctg aga gtg
912
Met Asp Arg Val Asn Pro Asp Gly Met Ala Phe Ile Pro Leu Arg Val
290 295 300

atc cca ttc gta cga gag aag ggc gtc cca cag gaa acg ctg gca ggc
960
Ile Pro Phe Val Arg Glu Lys Gly Val Pro Gln Glu Thr Leu Ala Gly
305 310 315 320

atc act gtg act aac ccg gcg cgg ttc tat gtc acc gac ctt gcg ggc
1008
Ile Thr Val Thr Asn Pro Ala Arg Phe Tyr Val Thr Asp Leu Ala Gly
325 330 335

gtc atg
1014
Val

<210> 2
<211> 337
<212> PRT
<213> Pseudomonas diminuta

<400> 2

Met Ser Ile Gly Thr Gly Asp Arg Ile Asn Thr Val Arg Gly Pro Ile
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Thr Ile Ser Glu Ala Gly Phe Thr Leu Thr His Glu His Ile Cys Gly
20 25 30

Ser Ser Ala Gly Phe Leu Arg Ala Trp Pro Glu Phe Phe Gly Ser Arg
35 40 45

Lys Ala Leu Ala Glu Lys Ala Val Arg Gly Leu Arg Arg Ala Arg Ala
50 55 60

Ala Gly Val Arg Thr Ile Val Asp Val Ser Thr Phe Asp Ile Gly Arg
65 70 75 80

Asp Val Ser Leu Leu Ala Glu Val Ser Arg Ala Ala Asp Val His Ile
85 90 95

Val Ala Ala Thr Gly Leu Trp Phe Asp Pro Pro Leu Ser Met Arg Leu
100 105 110

Arg Ser Val Glu Glu Leu Thr Gln Phe Phe Leu Arg Glu Ile Gln Tyr
115 120 125

Gly Ile Glu Asp Thr Gly Ile Arg Ala Gly Ile Ile Lys Val Ala Thr
130 135 140

Thr Gly Lys Ala Thr Pro Phe Gln Glu Leu Val Leu Lys Ala Ala Ala
145 150 155 160

Arg Ala Ser Leu Ala Thr Gly Val Pro Val Thr Thr His Thr Ala Ala

165

170

175

Ser Gln Arg Asp Gly Glu Gln Gln Ala Ala Ile Phe Glu Ser Glu Gly
180 185 190

Leu Ser Pro Ser Arg Val Cys Ile Gly His Ser Asp Asp Thr Asp Asp
195 200 205

Leu Ser Tyr Leu Thr Ala Leu Ala Ala Arg Gly Tyr Leu Ile Gly Leu
210 215 220

Asp His Ile Pro His Ser Ala Ile Gly Leu Glu Asp Asn Ala Ser Ala
225 230 235 240

Ser Ala Leu Leu Gly Ile Arg Ser Trp Gln Thr Arg Ala Leu Leu Ile
245 250 255

Lys Ala Leu Ile Asp Gln Gly Tyr Met Lys Gln Ile Leu Val Ser Asn
260 265 270

Asp Trp Leu Phe Gly Phe Ser Ser Tyr Val Thr Asn Ile Met Asp Val
275 280 285

Met Asp Arg Val Asn Pro Asp Gly Met Ala Phe Ile Pro Leu Arg Val
290 295 300

Ile Pro Phe Val Arg Glu Lys Gly Val Pro Gln Glu Thr Leu Ala Gly
305 310 315 320

Ile Thr Val Thr Asn Pro Ala Arg Phe Tyr Val Thr Asp Leu Ala Gly
325 330 335

Val

**Protein Comparisons
Percent Identity**

McDaniel vs Wild Lab 57.8%
McDaniel vs Serdar 59.5%
Serdar vs Wild Lab 100%

**DNA Comparisons
Percent Identity**

McDaniel vs Wild Lab 88.0%
McDaniel vs Serdar 83.7%
Serdar vs Wild Lab 99.6%

McDaniel.pro Met Gln Thr Arg Arg Val Val Leu Lys Ser Ala Ala Ala Arg Thr Leu Leu Gly Gly Leu Ala Gly Cys Ala Thr Trp Leu Asp Arg 29
Wild Lab.PRO Met Gln Thr Arg Arg Val Val Leu Lys Ser Ala Ala Ala Arg Thr Leu Leu Gly Gly Leu Ala Gly Cys Ala Thr Trp Leu Asp Arg 29
Serdar.pro Met Gln Thr Arg Arg Val Val Leu Lys Ser Ala Ala Ala Arg Thr Leu Leu Gly Gly Leu Ala Gly Cys Ala Thr Trp Leu Asp Arg 30

McDaniel.pro Ser Ala Gln Ala Met Arg Ser Ile Arg Ala Arg Pro Ile Thr Ile Ser Glu Ala Gly Phe Thr Leu Thr His Glu Asp Ile Ser Ala 58
Wild Lab.PRO Ser Ala Gln Ala Met Arg Ser Ile Arg Ala Arg Pro Ile Thr Ile Ser Glu Ala Gly Phe Thr Leu Thr His Glu Asp Ile Ser Ala 32
Serdar.pro Ser Ala Gln Ala Met Arg Ser Ile Arg Ala Arg Pro Ile Thr Ile Ser Glu Ala Gly Phe Thr Leu Thr His Glu Asp Ile Ser Ala 60

McDaniel.pro Ala Arg Gln Asp Ser Cys Val Leu Gly Gln Ser Ser Ser Val Ala Cln Ser Ser Ser Gly Lys Gly Cys Glu Arg 83
Wild Lab.PRO Ala Arg Gln Asp Ser Cys Val Leu Gly Gln Ser Ser Ser Val Ala Cln Ser Ser Ser Gly Lys Gly Cys Glu Arg 60
Serdar.pro Ala Arg Gln Asp Ser Cys Val Leu Gly Gln Ser Ser Ser Val Ala Cln Ser Ser Ser Gly Lys Gly Cys Glu Arg 88

McDaniel.pro Ile Ala Arg Gln Ser Gly Trp Arg Ala Asn Asp Cys Arg Cys Val Asp Phe Arg Tyr Arg Ser Arg Arg Gln Phe Ile Gly Arg Gly Phe 11
Wild Lab.PRO Ile Ala Arg Gln Ser Gly Trp Arg Ala Asn Asp Cys Arg Cys Val Asp Phe Arg Tyr Arg Ser Arg Arg Gln Phe Ile Gly Arg Gly Phe 89
Serdar.pro Ile Ala Arg Gln Ser Gly Trp Arg Ala Asn Asp Cys Arg Cys Val Asp Phe Arg Tyr Arg Ser Arg Arg Gln Phe Ile Gly Arg Gly Phe 11'

McDaniel.pro Ala Gly Cys Arg Arg Ser Tyr Leu Ala Ala Thr Gly Leu Trp Phe Asp Pro Pro Leu Ser Met Arg Leu Arg Tyr Val Glu Glu Leu Thr 14
Wild Lab.PRO Ala Gly Cys Arg Arg Ser Tyr Leu Ala Ala Thr Gly Leu Trp Phe Asp Pro Pro Leu Ser Met Arg Leu Arg Tyr Val Glu Glu Leu Thr 11
Serdar.pro Ala Gly Cys Arg Arg Ser Tyr Leu Ala Ala Thr Gly Leu Trp Phe Asp Pro Pro Leu Ser Met Arg Leu Arg Tyr Val Glu Glu Leu Thr 14'

McDaniel.pro Leu Val Leu Pro Ala Val Arg Phe Asn Met Ala Ser Lys Tyr Thr Gly Ile Arg Ala Gly Ile Ile Lys Val Ala Thr Thr Gly Lys 17
Wild Lab.PRO Leu Val Leu Pro Ala Val Arg Phe Asn Met Ala Ser Lys Tyr Thr Gly Ile Arg Ala Gly Ile Ile Lys Val Ala Thr Thr Gly Lys 14'
Serdar.pro Leu Val Leu Pro Ala Val Arg Phe Asn Met Ala Ser Lys Tyr Thr Gly Ile Arg Ala Gly Ile Ile Lys Val Ala Thr Thr Gly Lys 17

McDaniel.pro Ala Thr Pro Phe Gln Glu Leu Val Leu Lys Ala Ala Ala Arg Ala Ser Leu Ala Thr Gly Val Pro Val Thr Thr His Thr Ala Ala Ser 20
Wild Lab.PRO Ala Thr Pro Phe Gln Glu Leu Val Leu Lys Ala Ala Ala Arg Ala Ser Leu Ala Thr Gly Val Pro Val Thr Thr His Thr Ala Ala Ser 17
Serdar.pro Ala Thr Pro Phe Gln Glu Leu Val Leu Lys Ala Ala Ala Arg Ala Ser Leu Ala Thr Gly Val Pro Val Thr Thr His Thr Ala Ala Ser 20

McDaniel.pro Gln Arg Asp Gly Glu Arg Gly Arg Pro Pro Phe Leu Ser Pro Lys Leu Glu Pro Ser Arg Val Cys Ile Gly His Ser Asp Asp Thr Asp 23
Wild Lab.PRO Gln Arg Asp Gly Glu Arg Gly Arg Pro Pro Phe Leu Ser Pro Lys Leu Glu Pro Ser Arg Val Cys Ile Gly His Ser Asp Asp Thr Asp 20
Serdar.pro Gln Arg Asp Gly Glu Arg Gly Arg Pro Pro Phe Leu Ser Pro Lys Leu Glu Pro Ser Arg Val Cys Ile Gly His Ser Asp Asp Thr Asp 23

McDaniel.pro Asp Leu Ser Tyr Leu Thr Ala Leu Leu Arg Gly Tyr Leu Ile Gly Leu Asp His Ile Pro His Ser Ala Ile Gly Leu Glu Asp Asn 26
Wild Lab.PRO Asp Leu Ser Tyr Leu Thr Ala Leu Leu Arg Gly Tyr Leu Ile Gly Leu Asp His Ile Pro His Ser Ala Ile Gly Leu Glu Asp Asn 23
Serdar.pro Asp Leu Ser Tyr Leu Thr Ala Leu Leu Arg Gly Tyr Leu Ile Gly Leu Asp His Ile Pro His Ser Ala Ile Gly Leu Glu Asp Asn 26

McDaniel.pro Ala Ser Ala Ser Pro Leu Leu Gly Ile Arg Ser Trp Gln Thr Arg Ala Leu Leu Ile Lys Ala Leu Ile Asp Gln Gly Tyr Met Lys Gln 29
Wild Lab.PRO Ala Ser Ala Ser Pro Leu Leu Gly Ile Arg Ser Trp Gln Thr Arg Ala Leu Leu Ile Lys Ala Leu Ile Asp Gln Gly Tyr Met Lys Gln 26
Serdar.pro Ala Ser Ala Ser Pro Leu Leu Gly Ile Arg Ser Trp Gln Thr Arg Ala Leu Leu Ile Lys Ala Leu Ile Asp Gln Gly Tyr Met Lys Gln 29

McDaniel.pro Ile Leu Val Ser Asn Asp Trp Leu Phe Gly Phe Ser Ser Tyr Val Thr Asn Ile Met Asp Val Met Asp Arg Val Asn Pro Asp Gly Met 32
Wild Lab.PRO Ile Leu Val Ser Asn Asp Trp Leu Phe Gly Phe Ser Ser Tyr Val Thr Asn Ile Met Asp Val Met Asp Arg Val Asn Pro Asp Gly Met 29
Serdar.pro Ile Leu Val Ser Asn Asp Trp Leu Phe Gly Phe Ser Ser Tyr Val Thr Asn Ile Met Asp Val Met Asp Arg Val Asn Pro Asp Gly Met 32

McDaniel.pro Ala Phe Ile His 32
Wild Lab.PRO Ala Phe Ile His 32
Serdar.pro Ala Phe Ile His 35

McDaniel.pro 32
Wild Lab.PRO Arg Phe Leu Ser Pro Thr Leu Arg Ala Ser 33
Serdar.pro Arg Phe Leu Ser Pro Thr Leu Arg Ala Ser 36

Decoration 'Decoration #1': Shade (with black at 10% fill) residues that differ from McDaniel.pro.

Decoration 'Decoration #2': Box residues that differ from McDaniel.pro.

[illegible]

Decorations 'Decorations #1': Shaded (with black as 100 fill) residues that differ from McDaniel P diminuta.ssq.

Decorations 'Decorations #2': Box residues that differ from McDaniel P. 4 minute. 20g.

Works Cited

McDaniel P. diminuta :

McDaniel, C.S., Harper, L.L. and Wild, J.R., Cloning and sequencing of a plasmid-borne gene (opd) encoding a phosphotriesterase, J. Bacteriol. 170 (5), 2306-2311 (1988). Gene Bank Accession Number: M20392

Oph-lab RC: Wild lab DNA sequence

Serdar: Serdar Sequence obtained from United States Patent and Trademark Office (uspto.gov) Patent Number 5,484,728

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FILED 12-23-02 AND 01-02-03.